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### (54) **Coupling sleeve for a glue coupling**

(57) A glue sleeve coupling for a pipeline comprises a glue sleeve (3) as well as a pipeline end (2) contained in the glue sleeve, in which glue sleeve and pipeline end together describe at least one ring-shaped chamber (4) which is circumscribed by at least two constricted parts pointing inwardly, positioned in axial direction at a distance from each other. The ring-shaped chamber is filled

with a gluing agent through a filler opening (5) in the wall of the glue sleeve. The glue sleeve and the pipeline end together describe at least a second ring-shaped chamber adjacent to the first chamber, in such a way that when the first chamber is filled through the filler opening, the glue collecting in the first chamber and the excess glue, if any, can flow from the first chamber into the second chamber.

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## Description

The invention concerns a glue sleeve coupling for a pipeline comprising a glue sleeve as well as a pipeline end contained in the glue sleeve, in which glue sleeve and pipeline end together describe one ring-shaped chamber which is delimited by at least two constricted parts of the glue sleeve pointing inwardly, positioned in axial direction at a distance from each other, and filled with a gluing agent.

Such a glue sleeve coupling is disclosed in CH-A-661109. This known glue sleeve coupling has several disadvantages. The sealing between the constricted parts and the pipeline end, which dependent on the tolerances do not always fit exactly, leaves things to be desired. As a result, the glue introduced into the chamber is allowed to escape which causes insufficient coupling and sealing. The glue may escape from the chamber and stick to both the inside and outside of the pipelines. Especially excess glue inside the pipeline may cause problems. This excess glue is hard to detect and may give rise to pollution or disturbances of the medium to be transported through the pipes.

A further disadvantage is posed by the fact that the known glue sleeve cannot be properly manufactured by means of injection moulding. Especially the lips positioned deep in the inside of the glue sleeve cause problems when removing the product in question from the mould. The invention therefore aims at providing a glue sleeve coupling without these disadvantages. This aim is realized because the glue sleeve and pipeline end together describe at least a second ring-shaped chamber adjacent to the first chamber, in such a way that the glue collects in the first chamber and excess glue, if any, can flow from the first chamber into the second chamber.

When introducing the glue through the intake, it is collected in the chamber concerned, between the constricted parts which extend to the pipeline end in such a tight-fitting way that the glue is initially stopped there. Only after the chamber is filled and glue is nevertheless added, a certain excess pressure may occur as a result of which the glue would pass the constricted part. In the case of the sleeve coupling according to the present invention, this excess glue would end up in the second chamber. The same holds for the second chamber, i.e. that the glue can be first collected there without escaping. In this way, it is possible to prevent the glue from ending up on the inside or outside of the pipes in a reliable manner.

The glue sleeve coupling preferably contains four constricted parts, positioned in axial direction at a distance from each other, which together delimit three ring-shaped chambers, while the filler opening discharges into the middle chamber.

In order to ensure a proper delimitation of the chamber each constricted part may be provided with an internal, essentially, cylindrical surface of which the size in axial direction exceeds the radial size over which the

constricted part is extended from the internal wall of the glue sleeve.

The relatively large axial size of the constricted parts ensures that the gluing agent cannot easily escape from the slot, even if this is introduced with some excess pressure. The narrow slot remaining between the surfaces of each constricted part positioned right in front of each other, and the pipeline end properly hold the gluing agent as a result of adhesion.

10 A further advantage is that the glue sleeve applied in this coupling can indeed be easily removed from a mould. The constricted parts are relatively solid due to their larger axial size, which may cause some friction and deformation in removing them from the mould, but 15 does not cause permanent deformation of the constricted parts.

Taking the glue sleeve from the cast may be done even more easily if the slot side of each constricted part has an inclination of approximately 10-20° in relation to 20 the internal wall of the glue sleeve. An inclination of approximately 15° is preferable.

In order to ensure a proper collection of the gluing agent, the axial size of the slot near the in-feed side of the glue sleeve should be approximately equal to the 25 axial size of the cylindrical surface of a constricted part.

Moreover, an outlet for releasing the air dispelled at introduction of a gluing agent opens out into the first chamber. This outlet is diametrically positioned opposite from the intake, enabling virtually all air to be released 30 without formation of inclusions.

An important advantage of introducing the glue in such a carefully controlled manner is that there are hardly any volatile components, such as solvents, being released. Moreover, it is possible to introduce a precise 35 amount of glue into the chamber, sufficient to establish a reliable coupling. In this way, the use of large quantities is avoided, which is often a problem when attaching by means of a brush.

The invention also concerns a glue sleeve for application in the glue sleeve coupling according to the 40 present invention.

The invention will be explained in more detail below by means of various designs represented in the figures.

Figure 1 shows the sleeve coupling according to the 45 invention, partly in a cross-section representation.

Figure 2 partly shows a first variety of the sleeve in cross-section.

Figure 3 partly shows a second variety of the sleeve in cross-section.

50 The glue sleeve coupling between the pipes 1, 2 represented in figure 1 contains a sleeve 3 according to the invention, into which the end of the other pipe 2 has been fitted.

Between the sleeve 3 and the pipe 2 a ring-shaped 55 chamber 4 is located, which can be filled with a gluing agent through opening 5 for coupling and sealing the pipes 1, 2. On both sides of the chamber 4 two other ring-shaped chambers 28, 29 are located.

As represented in figure 1, the glue sleeve 3 according to the first variety contains four constricted parts 6, 26, 7, 27 which all have a cylindrical surface on the inside. The axial sizes of these cylindrical surfaces of the constricted parts 6, 26, 7, 27 exceed the height over which this constricted part 6, 7 extends in relation to the internal wall 8 of the glue sleeve.

The angled sides 9, 10 of the constricted parts with an angle of approximately 15° go over into the constricted part of the internal wall 8 of the glue sleeve 3 delimiting the chambers 4; 28, 29.

The advantage of this design is that in introducing the glue through opening 5, it will be collected in chamber 4 and will hardly be able to escape from the narrow slots between the constricted parts 6, 26, 7, 27 and the pipe. This is due, among others, to the axial size of the cylindrical surfaces of the constricted parts 6, 26, 7, 27 which constitute a slot so narrow that all glue will first be collected in chamber 4 before escaping, if at all.

In case of excessive introduction of glue, a rise of pressure will initially occur in chamber 4. Subsequently, the glue will penetrate the chambers 28, 29. In these chambers 28, 29 the glue is obstructed from escaping any further by the constricted parts 6, 27 which prevent any glue from ending up inside or outside the pipes 1, 2.

The variety in figure 3 shows a glue sleeve 11 with three constricted parts 12, 13, 14 each with an internal cylindrical surface. These three constricted parts 12, 13, form two cylindrical chambers 15, 16 between the internal wall 17 respectively 18 of the glue sleeve 11 and the pipe 2.

When introducing the glue through opening 5 it will first be collected in the ring-shaped chamber 17. Due to the axial size of the cylindrical surface of the constricted parts 12, 13 the glue is not likely to quickly escape from chamber 17 either.

In the case excessive introduction of glue causes glue to escape after all, this will first be collected in the second ring-shaped chamber 16, which, in turn, is again adjacent to cylindrical surface of the constricted part 14. In this variety it is very unlikely that the glue escapes in such a way that it ends up on the external surface of pipe 2.

The same applies to this second variety, i.e. that the constricted parts 12, 13, 14 go over into the walls 16, 17 by means of angled sides 19, 20, 21, 22.

The advantage of these angled transitional sides in both varieties is that the sleeve can be easily removed from the mould. The mandrel of the mould may be constructed without movable parts, since the flexibility of the plastic material enables easy sliding of the constricted parts over the mandrel, as a consequence of these angled transitional sides 9, 10 in the first variety, and 19, 20, 21, 22 in the second variety.

## Claims

1. Glue sleeve coupling for a pipeline, comprising a glue sleeve (3, 11) as well as a pipeline end (2) contained in the glue sleeve, in which glue sleeve (3, 11) and pipeline end (2) together describe at least a ring-shaped chamber (4; 15,16) which is delimited by at least two constricted parts pointing inwardly (6, 26, 7, 27; 12, 13, 14), positioned in axial direction at a distance from each other and filled with a gluing agent through a filler opening in the wall of the glue sleeve characterized in that glue sleeve (3, 11) and pipeline end (2) together describe at least a second ring-shaped chamber (28, 29; 16) adjacent to the first chamber (4, 15), in such a way that when filling the first chamber through the filler opening (5), the glue is collected in the first chamber (4, 15) and an excess of glue, if any, can escape from the first chamber (4, 15) into the second chamber (28, 29; 16).
2. Glue sleeve coupling according to claim 1, in which the glue sleeve contains three constricted parts (12, 13, 14), positioned in axial direction at a distance from each other, which together delimit two ring-shaped chambers (15, 16).
3. Glue sleeve coupling according to claim 2, in which the glue sleeve contains four constricted parts (6, 26, 7, 27), positioned in axial direction at a distance from each other, which together delimit three ring-shaped chambers (4, 28, 29), and the filler opening (5) discharges into the middle chamber (4).
4. Glue sleeve coupling according to claim 3, in which the axial size of the middle chamber (4) exceeds the axial size of each external chamber (28, 29).
5. Glue sleeve coupling according to claim 1 or 2, in which the side of each constricted part (6, 26, 7, 27; 12, 13, 14) pointed towards the chamber (4, 28, 29; 15, 16) runs with an inclination of approximately 10-20° in relation to the internal wall (8; 17, 18) of the glue sleeve (3, 11).
6. Glue sleeve coupling according to claim 5, in which the inclination amounts to approximately 15°.
7. Glue sleeve coupling according to claims 2- 6, in which the axial size of the chambers (28, 29; 16) without a supply opening (5) discharging into it approximately about equals the axial size of the cylindrical surface of a constricted part (14, 27).
8. Glue sleeve coupling according to one of the previous claims, in which the first chamber (4, 15) is fitted with an outlet (5) for the purpose of releasing the air dispelled at introduction of a gluing agent.

9. Glue sleeve coupling according to one of the previous claims, in which each constricted part (6, 26, 7, 27; 12, 13, 14) has an internal diameter exceeding the external diameter of the pipeline end (2). 5
10. Glue sleeve coupling according to one of the previous claims, in which each constricted part (6, 26, 7, 27; 12, 13, 14) has an inside, essentially, cylindrical surface of which the size in axial direction exceeds the radial size over which this constricted part is extended from the internal wall (8; 17, 18) of the glue sleeve (3, 11). 10
11. Glue sleeve (3, 11) for application in the glue sleeve coupling according to one of the previous claims provided with at least two constricted parts (6, 26, 7, 27; 12, 13, 14) pointing inwardly, positioned in axial direction at a distance from each other, which delimit a part of a wall containing a filler opening for the introduction of glue characterized in that at least a third constricted part pointing inwardly is provided which is located in axial direction at a distance from the other constricted parts. 15
12. Glue sleeve according to claim 11, in which four constricted parts (6, 26, 7, 27; 12, 13, 14), positioned in axial direction at a distance from each other, are provided, and the filler opening (5) is located between the middle constricted parts (26, 7). 20
13. Glue sleeve according to claim 12, in which the axial distance of the middle constricted parts (26, 7) in each instance exceeds the distance between a middle (26, 7) and an outer constricted part (6; 27). 25
14. Glue sleeve according to one of the claims 11-13, in which the side of each constricted part (6, 26, 7, 27; 12, 13, 14) to its adjacent constricted part runs with an inclination of approximately 10-20° in relation to the internal wall (8; 17, 18) of the glue sleeve (3, 11). 30
15. Glue sleeve according to claim 14, in which the inclination amounts to approximately 15°. 35
16. Glue sleeve according to one of the previous claims 11-15, in which the axial size of the space between the restricted parts (6, 26, 7, 27; 13, 14) near the in-feed end of the glue sleeve (11) approximately equals the axial size of the cylindrical surface of one of the constricted parts. 40
17. Glue sleeve according to one of the claims 11-16, in which between at least one of the constricted parts (26, 7, 12, 13) an outlet (5) is located for releasing the air dispelled at introduction of the gluing agent. 45
18. Glue sleeve according to one of the claims 11-17, in which each constricted part (6, 26, 7, 27; 12, 13, 14) has an internal, essentially cylindrical surface with a size in axial direction exceeding the radial size over which this constricted part extends from the internal wall (8; 17, 18) of the glue sleeve (3, 11). 50
- 55

fig -1

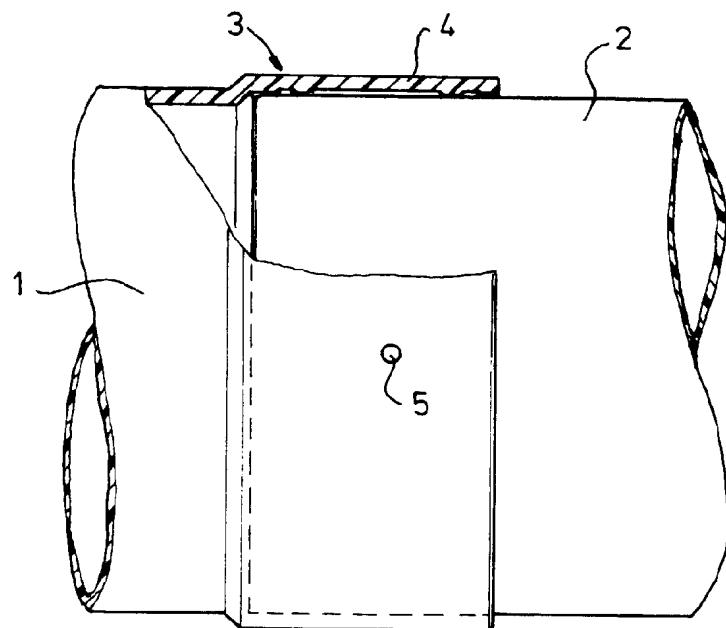


fig -2

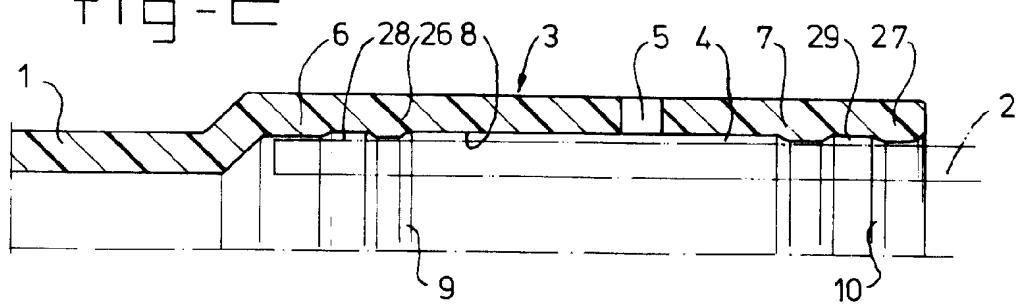
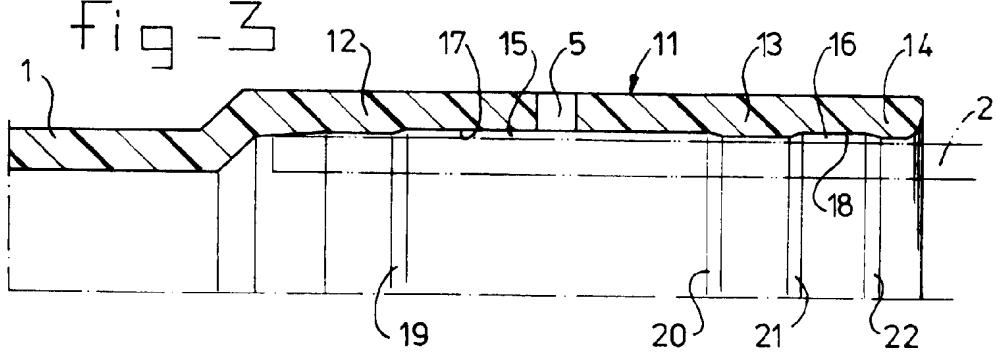


fig -3





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## EUROPEAN SEARCH REPORT

Application Number  
EP 98 20 0642

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.)						
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim							
P, X	WO 97 21953 A (F. VANESKY) 19 June 1997 * the whole document *	1, 2, 9	F16L47/02 F16L13/11 B29C65/54						
X	DE 27 07 492 A (BOSTIK GMBH) 24 August 1978 * the whole document *	1							
A	GB 963 910 A (A. STULZ) 15 July 1964 * the whole document *	1							
A, D	CH 661 109 A (G. FISCHER AG) 30 June 1987 * the whole document *	1							
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.)						
			F16L B29C						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">Place of search</th> <th style="width: 33%;">Date of completion of the search</th> <th style="width: 34%;">Examiner</th> </tr> <tr> <td>THE HAGUE</td> <td>2 June 1998</td> <td>Angius, P</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	2 June 1998	Angius, P
Place of search	Date of completion of the search	Examiner							
THE HAGUE	2 June 1998	Angius, P							
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone      Y : particularly relevant if combined with another document of the same category      A : technological background      O : non-written disclosure      P : intermediate document</p> <p>T : theory or principle underlying the invention      E : earlier patent document, but published on, or after the filing date      D : document cited in the application      L : document cited for other reasons      &amp; : member of the same patent family, corresponding document</p>									